Application No.: 10/774,577 Docket No.: 8650.027.00-US Amdt, dated September 13, 2007

Reply to Office Action dated June 15, 2007

## **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application.

## **Listing of Claims:**

1. (Currently Amended) An electroluminescent device comprising a first electrode, an organic electroluminescent element, and a second electrode wherein said electroluminescent element includes a fluorescent 1,1'-binaphthyl derivative represented by Formula (I):

Formula (1)

wherein R<sub>1</sub> and R<sub>4</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group, and combinations thereof; and R<sub>2</sub> and R<sub>3</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl,

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diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and triazinyl; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group, and combinations thereof.

2. (Original) An electroluminescent device in accordance with claim 1 wherein said electroluminescent element includes an emitting layer comprised of a host 1,1'-

binaphthyl derivative comprised of Formula (I) and a guest fluorescent or

phosphorescent dye.

3. (Original) An electroluminescent device in accordance with claim 2 wherein

said fluorescent or phosphorescent dye possesses a bandgap no greater than that of said host

material.

4. (Original) An electroluminescent device in accordance with claim 2

wherein said fluorescent or phosphorescent dye is present in a concentration of from about 0.01

to about 10 mole percent, based on the moles of said 1,1'-binaphthyl derivative host material.

5. (Original) An electroluminescent device in accordance with claim 1

wherein said element is a layer, said first electrode is an anode, and said second electrode is a

cathode.

6. (Previously Presented) An electroluminescent device in accordance with

claim 1 wherein said element is comprised of a layered electroluminescent arrangement

comprised of a hole transport layer, and a light emitting layer wherein 1,1'-binaphthyl

derivatives are added thereto, and an electron transport layer; and which element is positioned

between said first and second electrodes.

7. (Original) An electroluminescent device in accordance with claim 1

wherein said element represents a single layer, a plurality of layers, or a plurality of laminated

layers.

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8. (Currently Amended) An electroluminescent device comprising a first electrode, an organic electroluminescent element, and a second electrode wherein said electroluminescent element includes a fluorescent 1,1'-binaphthyl derivative represented by Formula (II):

$$R_1$$
 $R_2$ 
 $R_4$ 
 $R_6$ 

Formula (II)

wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano, group, and combinations thereof; and R<sub>5</sub> and R<sub>6</sub> are substituents selected from the group consisting of an aryl or substituted aryl with about 6 to about 30 carbon atoms; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and triazinyl; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; a silicon atom which can be substituted with a trimethyl; diphenylmethyl, triphenyl group; and combinations thereof.

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9. (Original) An electroluminescent device in accordance with claim 8 wherein said  $R_5$  and  $R_6$  are selected from the group consisting of phenyl, tolyl, naphthyl, anthryl, phenylanthryl, diphenylanthryl, biphenylyl, phenylvinyl, diphenylvinyl, perylene, furyl, thienyl, pyridyl, trimethylsilyl and triphenylsilyl.

10. (Previously Presented) An electroluminescent device comprising a first electrode, an organic electroluminescent element, and a second electrode wherein said electroluminescent element includes a fluorescent 1,1'-binaphthyl derivative represented by Formula (III):

$$R_1$$
 $R_2$ 
 $R_7$ 
 $R_8$ 
 $R_8$ 

Formula (III)

wherein R<sub>1</sub> and R<sub>4</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group; and combinations thereof; R<sub>2</sub> and R<sub>3</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24

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necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and triazinyl; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group; and combinations thereof; and R<sub>7</sub> and R<sub>8</sub> are substituents selected from the group consisting of alkyl of from 1 to about 25 carbon atoms; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group; and combinations thereof.

- 11. (Original) An electroluminescent device in accordance with claim 10 wherein said R<sub>7</sub> and R<sub>8</sub> are selected from the group consisting of methyl, ethyl, methoxy, ethoxy, isopropoxy, butoxy, dimethylamino, diethylamino, fluorine, chlorine, bromine and cyano.
- 12. (Previously Presented) An electroluminescent device comprised of a first electrode, an organic electroluminescent element, and a second electrode wherein said electroluminescent element contains a fluorescent 1,1'-binaphthyl derivative represented by Formula (IV):

Formula (IV)

wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30

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carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group; and combinations thereof; and R<sub>5</sub> and R<sub>6</sub> are substituents selected from the group consisting of an aryl or substituted aryl with about 6 to about 30 carbon atoms; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and triazinyl; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; and combinations thereof; and R<sub>7</sub> and R<sub>8</sub> are substituents selected from the group consisting of alkyl of from 1 to about 25 carbon atoms; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group; and combinations thereof.

- 13. (Previously Presented) An electroluminescent device comprised of a first electrode, an organic luminescent element, and a second electrode wherein said electroluminescent element contains a 1,1'-binaphthyl derivative selected from the group consisting of 4,4'- phenyl-1,1'-binaphthyl, 4,4'-(4-t-butylphenyl)-1,1'-binaphthyl, 4,4'-(2-naphthyl)-1,1'- binaphthyl, 4,4'-(1-naphthyl)-1,1'-binaphthyl, 4,4'-anthracene-1,1'-binapthyl, 4,4'- triphenylsilyl-1,1'-binaphthyl, and 2,2'-methoxy-6,6-phenyl-1,1'-binaphthyl.
- 14. (Currently Amended) An organic electroluminescent device comprising in the following sequence an anode, an optional buffer layer, a hole transporting layer, a light emitting layer comprised of a 1,1 '-binaphthyl derivative of Formula (I), an electron transport layer, and a cathode, wherein Formula (I) is:

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Formula (1)

wherein R<sub>1</sub> and R<sub>4</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group, and combinations thereof; and R<sub>2</sub>, and R<sub>3</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and triazinyl; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group, and combinations thereof.

- 15. (Original) An electroluminescent device in accordance with claim 14 wherein said light emitting layer further comprises a fluorescent or phosphorescent dye.
  - 16. (Original) An electroluminescent device in accordance with claim 14

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wherein said anode is comprised of indium tin oxide in a thickness of from about 1 to about 500 nanometers; said buffer layer is comprised of a phthalocyanine derivative in a thickness of from, about 5 to about 80 nanometers, said hole transport layer is comprised of a tertiary aromatic amine in a thickness of from about 5 to about 300 nanometers; said light emitting layer is of a thickness of about 5 to about 300 nanometers, and said cathode is comprised of a magnesium

silver alloy or a lithium aluminum alloy in a thickness of from about 10 to about 800 nanometers.

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